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# Management of patients following laparoscopic procedures, for the non-expert

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## What you need to know

- The length of the recovery period depends upon the procedure that has been performed, and may be as short as 1-2 weeks
- Patients should refrain from driving until they are comfortably able to look in their blind spot and perform an emergency stop
- Worsening post-operative pain suggests a potential abdominal complication, and the patient requires urgent assessment
- Although most wound infections after laparoscopic surgery are superficial, some can involve the deeper tissues and should be re-assessed in hospital, particularly if prosthetic material has been inserted (e.g. mesh)

## **Introduction**

Laparoscopy has revolutionized the field of abdominal surgery over the past thirty years. The total number of laparoscopic surgical operations performed annually worldwide is approximately 15 million, of which 10% are performed in the UK<sup>2</sup>. This technique – also known as minimally invasive surgery - involves the use of cameras and specially designed instruments that allow surgeons to perform operations without the need for a large abdominal incision. It has gained worldwide popularity and acceptance by surgeons and patients alike. Better intra-operative visibility, minimal scarring, less pain, shorter hospital stay and faster recovery are the main reasons behind the appeal of laparoscopic surgery<sup>1</sup>. This practice pointer discusses the important considerations around the management of patients following laparoscopic surgical procedures.

## **Laparoscopy – what's changed?**

As well as cholecystectomy, appendicectomy and tubo-ovarian procedures, laparoscopy is now increasingly used for hysterectomy, bariatric procedures and many gastrointestinal and urological cancer resections, and it is also possible to perform aortic aneurysm repair laparoscopically<sup>3,4,5</sup>. Further technological advances have resulted in the development of several variations on the 'standard' laparoscopic approach, which are described in Table 1.

Enhanced recovery programs are increasingly popular and are ideally suited to laparoscopic surgery. There is evidence to suggest that this approach reduces length of stay without increasing post-operative complications, when compared with standard care<sup>6</sup>. Enhanced recovery starts and ends many weeks before and after the surgical procedure itself; the main elements are outlined in Table 2.

### **When are patients typically discharged after laparoscopic surgery?**

This depends upon the type of surgery that has been performed, and patient factors such as co-morbidities. Day case procedures are becoming more common: for example, over 60% of patients undergoing laparoscopic cholecystectomy are now discharged on the same day<sup>7</sup>. Discharge criteria include the ability to mobilise and control pain with simple analgesia. Although desirable, passing urine and oral intake are no longer seen as absolute requirements prior to discharge<sup>8</sup>. Patients are usually provided with information leaflets about expected recovery period, emergency contact details and follow-up schedules, although further appointments are often not required after routine procedures.

### **Which medications are usually prescribed?**

Patients are usually discharged from hospital with simple analgesia. Sometimes it is appropriate to provide medication(s) to counteract the side effects of analgesia (such as laxatives, anti-emetics or proton pump inhibitors), and thromboprophylaxis (see below).

#### *Analgesia*

The duration of analgesia depends on the type of operation that has been performed. For operations such as appendicectomy or cholecystectomy, patients often require regular paracetamol, weak opioids (e.g. codeine), and/or NSAIDs for the first week after surgery, reducing to 'as required' after that. Following larger operations (e.g. for gastrointestinal cancer), patients may require regular analgesia for up to 2 months.

#### *Thromboprophylaxis*

Daily pharmacological prophylaxis is administered for the duration of all patients' hospital stay. Venous thromboembolism – i.e. deep venous thrombosis or pulmonary embolism – is not common following laparoscopic surgery, occurring in less than 1% of patients<sup>9</sup>. The

duration of thromboprophylaxis depends upon the procedure that has been performed. NICE advise the use of extended pharmacological VTE prophylaxis for 28 days following cancer surgery<sup>10</sup>. Although NICE does not specifically provide recommendations for bariatric procedures, obesity is a risk factor for VTE and such patients usually also receive extended VTE prophylaxis<sup>11</sup>. There is no clear evidence to say which type of pharmacological prophylaxis is best, and individual units or surgeons may demonstrate a preference. Where appropriate, patients are taught the self-administration technique for heparin injections. If anticoagulant therapy was stopped pre-operatively, patients are usually able to recommence this before or at the point of discharge.

### **Wound care**

Subcuticular absorbable sutures are the most commonly used materials for closing laparoscopic wounds. Simple adhesive dressings are typically applied to each wound, although there is no evidence to suggest that dressings reduce the rate of wound infection<sup>12</sup>. Increasingly, skin glue is being used as a 'dressing', with the advantage that it renders the wound waterproof, meaning patients can shower immediately after surgery<sup>13</sup>. Patients with adhesive dressings are generally advised to avoid soaking the wounds in water for a few days after surgery. Unless there is excessive discharge of fluid from the wounds, there is generally no need to replace the dressings once they have fallen off.

### **Post-operative restrictions**

Although the 'port site' wounds suggest a modest intervention, the underlying procedure is usually more extensive, and patients need to remember that a period of recovery will be required. The speed at which normal activity is resumed after laparoscopic surgery largely depends upon the extent and type of operation that has been performed. Many surgeons will use the phrase "if it hurts, don't do it" and explain to patients that they should notice an

almost daily increase in the activities they are able to undertake without experiencing pain or discomfort.

### *Driving*

This is dependent on the type of laparoscopic procedure that has been performed. For example, a patient undergoing laparoscopic cholecystectomy or hernia repair may be able to drive after 1-2 weeks<sup>14</sup>, whereas those undergoing hernia repair or larger cancer procedures may need to wait longer. Patients should only be allowed to drive if they are comfortably able to apply an emergency brake, look in their blind spot and have sufficient reaction times. Drivers do not need to notify the DVLA of surgical recovery unless it is likely to persist for more than 3 months<sup>15</sup>.

### *Return to work*

There are no clear guidelines on when patients should return to work. It is usually an individual decision, and depends on their occupation and the procedure performed. Patients may only require two weeks away from work after smaller procedures (such as cholecystectomy or appendicectomy)<sup>16</sup>. Following cancer surgery, a longer break, or gradual return to work may be advised, such as light duties or reduced hours<sup>16</sup>. "Sick notes" are provided by the hospital team to cover the anticipated period of absence.

### *Heavy lifting*

Heavy lifting after laparoscopic surgery is controversial and under-researched. Whereas some sources state that lifting should be avoided for six weeks<sup>17</sup>, 1-2 and 4 weeks are generally thought to be sufficient for smaller and larger procedures, respectively<sup>16</sup>. During this time, patients are advised not to lift anything heavier than a kettle or a shopping bag.

They are also asked to avoid pushing and pulling activities, such as vacuuming, scrubbing the bath, hanging up heavy washing and mowing the lawn.

### *Eating and drinking*

Restrictions on eating and drinking are dependent on the procedure that has been undertaken. For most, there are no restrictions. Operations for morbid obesity, anti-reflux procedures, and oesophago-gastric cancer, may initially require patients to follow a liquid diet<sup>18</sup>.

### *Travel*

The risk of venous thromboembolism associated with air travel increases with the duration of travel and number of flights over a short time period<sup>19</sup>. The Civil Aviation Agency advise patients not to fly for 24 hours after laparoscopy, due to the potential for expansion of retained carbon dioxide in the abdominal cavity<sup>20</sup>. A sensible precaution would be to use thromboembolic stockings if flying within one month of surgery.

## **What complications commonly present to primary care?**

The majority of patients have very little pain after 'minor' laparoscopic surgery, and are often eager to mobilise soon afterwards. Appetite may be unaffected and apart from feeling tired, they may otherwise feel 'back to normal' quite quickly. It is important to bear these features in mind when assessing a patient following laparoscopic surgery, as a failure to meet these milestones may indicate an abdominal complication<sup>21</sup>.

### *Pain*

Despite the use of small incisions, mild pain is common following laparoscopic surgery. Sometimes, the carbon dioxide used to inflate the abdomen can remain inside, causing

cramps, bloating and shoulder tip pain. These symptoms generally subside after 24 hours. If pain worsens after this time period, there should be a low threshold for suspecting that an abdominal complication has occurred. Table 3 (see below) outlines the other symptoms and signs that may be suggestive of an intra-abdominal complication<sup>21</sup>.

#### *Wound infection*

Any wound that is red, oozing, hot, swollen or tender may be infected and antibiotics are usually required. If there is a concern about deeper infection (and especially where prosthetic material, such as mesh, was inserted during the laparoscopic procedure), urgently refer the patient to hospital for review by the surgical team.

#### *Distinguishing between haematoma, abscess and seroma*

These complications all cause swelling at the operative site. There are various defining features of these complications that may help to distinguish one from another (Table 4). In cases of diagnostic doubt, ultrasound can be helpful. Whereas seromas are often treated conservatively, abscesses and (large) haematomas almost always require surgical intervention.

#### *Other post-operative complications*

Whilst laparoscopic surgery offers many advantages, abdominal complications may present more subtly than after a traditional 'open' operation<sup>21</sup>. The complications themselves are almost identical, and largely depend upon the nature of the operation that has been performed. For example, division of adhesions confers the risk of bowel damage, cholecystectomy may result in leakage of bile into the peritoneal cavity, and leakage from staple lines or anastomoses may occur after surgical procedures for morbid obesity or gastrointestinal cancer surgery. It is not the complication *per se* which is critical, rather the



time frame in which it is identified and treated. In the absence of clear evidence of continuing improvement, further investigation is urgently needed and prompt referral of patients to hospital is therefore crucial. Imaging and blood tests should be performed quickly at the point of hospital admission, rather than in the community, which may delay treatment. Table 3 outlines the symptoms and signs that may raise the suspicion of an intra-abdominal complication.

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**Table 1 Variations on standard laparoscopic techniques**

Name of laparoscopic technique		Description
SILS	Single incision laparoscopic surgery	The surgeon operates almost exclusively through a single entry point, typically the patient's umbilicus, leaving a single scar.
NOTES	Natural orifice endoscopic surgery	Performed with an endoscope passed through a natural orifice (e.g. mouth, anus) then through an internal incision (e.g. stomach, colon), thus avoiding any external incisions or scars.
Robotically-assisted laparoscopic surgery		Robotic systems, controlled by surgeons, are used to facilitate operations. The main perceived advantage is articulation beyond normal manipulation, resulting in improved ergonomics.
Laparo-endoscopic surgery		Combination of laparoscopic and endoscopic surgery (e.g. for removal of gastrointestinal polyps), eliminating the need for more major surgery (e.g. bowel or stomach resection).

**Table 2 The main elements of enhanced recovery programmes**

<b>Time period</b>	<b>Element</b>
<b>Pre-operative care</b>	Pre-operative assessment visit
	Lifestyle changes: stop smoking, lose weight, reduce alcohol, increase exercise
	Correct anaemia
	Optimise diabetic care
	Pre-operative carbohydrate drinks
<b>Admission to hospital</b>	Admission on the day of surgery
	Carbohydrate drinks and water up to 2 hours before surgery
<b>Peri-operative care</b>	Use of minimally invasive techniques
	Individualised fluid balance therapy
	Prevention of hypothermia
	Minimise use of drains and tubes
<b>Post-operative care</b>	Early mobilisation
	Early return to eating and drinking
	Early discharge planning

**Table 3 Symptoms and signs suggestive of an intra-abdominal complication following laparoscopic surgery**

Worsening abdominal pain
Anorexia or reluctance to drink
Reluctance to mobilise
Nausea or vomiting
Tachycardia
Abdominal tenderness or distension
Poor urine output
Pyrexia

**Table 4 Distinguishing features of abscess, haematoma and seroma**

	<b>Haematoma</b>	<b>Abscess</b>	<b>Seroma</b>
<b>Time of onset</b>	Usually within 24-48 hours of surgery	Usually 3-7 days after surgery	Usually later onset (after a week)
<b>Overlying skin colour</b>	Bruising may be present	Red, may be oozing pus	Normal
<b>Overlying skin temperature</b>	Normal	Hot	Normal
<b>Degree of pain</b>	May be painful	Often exquisitely tender	Usually only slight discomfort